Amendments to the Claims

Please amend the claims without prejudice, such that this listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (original) A method for reducing the interfering effect of a radar transmitter occupying a nominal frequency bandwidth into an other operating band, where said other operating band is spaced from said nominal frequency bandwidth by a third frequency band, said method comprising the steps of:

generating at said radar transmitter a constant-amplitude pulse centered at a frequency within said nominal frequency bandwidth of said radar and having a nominal bandwidth which lies within said nominal frequency bandwidth, and which also has an actual bandwidth which extends into said other operating band;

applying phase perturbations to said constant-amplitude pulse so as to produce a phase-perturbed constant-amplitude pulse centered at said frequency within said nominal frequency bandwidth of said radar with reduced amplitude of that portion of said actual bandwidth of said constant-amplitude pulse which lies within said other operating band; and

transmitting said phase-perturbed constant-amplitude pulse toward a radar target.

2. (original) A method for reducing interference between constant-amplitude long-range and short-range radar subpulses, where said long-range radar subpulses are centered at a first frequency and have a first nominal passband and said short-range pulses are centered at a second frequency, different from said first frequency and having a second nominal passband, the passband of at least one of said long-range and short-range radar subpulses extending at least partially into said nominal passband of the other of said long-range and short-range radar subpulses, said method comprising the steps of:

selectively applying phase perturbations to said one of said long-range and short-range radar subpulses to tend to null that portion of said passband of said one of said

long-range and short-range radar subpulses which extends into said nominal passband of said other one of said long-range and short-range radar subpulses.

3. (original) A method according to claim 2, wherein said step of selectively applying phase perturbations includes the steps of:

(a) Compute s_k, the nominal pulse's k^{th} digital sample as:

$$s_k = \cos (2\pi (f_0 / f_s) k + \theta_k)$$

where:

k is a sample index ranging between 1 and N, the total number of samples in the net pulse;

f_0 is the pulse's center frequency at the input to the digital-to-analog (D/A) converter;

f_s is the sample rate at which the signal samples are to be read out of a digital memory (and the same rate at which the D/A converter operates); and

θ_k is the pulse's nominal phase modulation function;

(b) compute the phase perturbation as:

$$\phi = \lambda [\lambda \mathbf{DRD+I}]^{-1} \mathbf{DRs}$$

where:

ϕ is an N x 1 column vector of phase perturbation samples with k^{th} element equal to ϕ_k;

λ is a positive scalar, greater than unity, whose value determines null depth;

D is an N x N diagonal matrix (all off-diagonal elements are zero) whose k^{th} diagonal element is similar to s_k with the cosine function replaced by the sine;

R is an N x N matrix that determines null center frequency, width, and shape;

I is an N x N identity matrix; and

s is an N x 1 vector whose k^{th} element is equal to s_k, to thereby define a k^{th} signal sample as

$$\tilde{s}_k = \cos (2\pi (f_0 / f_s) k + \theta_k + \phi_k)$$

where the tilde indicates a sample of the phase-perturbed pulse and ϕ_k is the k^{th} sample of the phase perturbation that creates the desired spectral null.

4. (new) A method of transmitting a radar pulse, comprising the steps of:

generating a constant-amplitude pulse centered at a center frequency and having an actual bandwidth which includes a selected frequency range;

applying phase perturbations to said constant-amplitude pulse so as to produce a phase-perturbed constant-amplitude pulse centered at said center frequency with reduced amplitude in said selected frequency range and relatively higher amplitudes above and below said selected frequency range; and

transmitting said phase-perturbed constant-amplitude pulse toward a radar target.

5. (new) The method of claim 4, wherein the phase perturbations are based in part on a null depth factor, a value of said null depth factor determining the reduced amplitude.

6. (new) The method of claim 4, wherein the phase perturbations are based in part on a null center factor, a value of said null center factor determining at least one of frequency, width and shape of said pulse in said selected frequency range.